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| Substitute Form PTO-1449<br>(Modified)   | U.S. Department of Commerce<br>Patent and Trademark Office | Attorney's Docket No.<br>13445-002002 | Application No.<br>10/620,479 |
| Information Disclosure Statement<br>by Applicant<br>(Use several sheets if necessary)<br><br>(37 CFR §1.98(b)) |  | Applicant<br>Steven G. Johnson et al. |                               |
|  |  | Filing Date<br>July 16, 2003          | Group Art Unit                |

## Foreign Patent Documents or Published Foreign Patent Applications

| Examiner Initial | Desig. ID | Document Number | Publication Date | Country or Patent Office | Class | Subclass | Translation |    |
|------------------|-----------|-----------------|------------------|--------------------------|-------|----------|-------------|----|
|                  |           |                 |                  |                          |       |          | Yes         | No |
| mc               | BA        | 2,288,469       | 10/1995          | Great Britain            |       |          |             |    |
|                  | BB        | 0 060 085       | 09/1982          | Europe                   |       |          |             |    |
|                  | BC        | 0 195 630       | 09/1986          | Europe                   |       |          |             |    |
|                  | BD        | 0 426 203       | 05/1991          | Europe                   |       |          |             |    |
|                  | BE        | 2000-035521     | 02/2000          | Japan                    |       |          |             |    |
|                  | BF        | 2001-051244     | 02/2001          | Japan                    |       |          |             |    |
|                  | BG        | WO 94/09393     | 04/1994          | WIPO                     |       |          |             |    |
|                  | BH        | WO 94/16345     | 07/1994          | WIPO                     |       |          |             |    |
|                  | BI        | WO 97/01774     | 01/1997          | WIPO                     |       |          |             |    |
|                  | BJ        | WO 99/47465     | 09/1999          | WIPO                     |       |          |             |    |
|                  | BK        | WO 99/49340     | 09/1999          | WIPO                     |       |          |             |    |
|                  | BL        | WO 99/49341     | 09/1999          | WIPO                     |       |          |             |    |
|                  | BM        | WO 00/22466     | 04/2000          | WIPO                     |       |          |             |    |
|                  | BN        | WO 00/51268     | 08/2000          | WIPO                     |       |          |             |    |
|                  | BO        | WO 00/51269     | 08/2000          | WIPO                     |       |          |             |    |
|                  | BP        | WO 00/77549     | 12/2000          | WIPO                     |       |          |             |    |
| mc               | BQ        | WO 01/69295     | 09/2001          | WIPO                     |       |          |             |    |
|                  | BR        |                 |                  |                          |       |          |             |    |

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|------------------|-----------|---|
| mc               | BS        | A. G. Bulushev et al. "Spectrally selective mode conversion at in homogeneities of optical fibers," Sov. Tech. Phys. Lett., 14, 506-507 (1988). |
|                  | BT        | A. N. Lazarchik, "Bragg fiber lightguides," Radiotekhnika i elektronika, 1, 36-43 (1988).   |
|                  | BU        | C. M. de Sterke et al., "Differential losses in Bragg fibers," J. Appl. Phys., 76, 680-688 (1994).  |
|                  | BV        | C. Moeller, "Mode converters in the Doublet III ECH microwave system," Int. J. Electronics, 53, 587-593 (1982).                                 |
| mc               | BW        | D. Marcuse et al., "Mode conversion caused by diameter changes of a round dielectric waveguide," Bell Syst. Tech. J., 48, 3217-3232 (1969).     |

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| Examiner Signature<br><i>Michael R. Connelly-Cushwa</i>  | Date Considered |
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| Examiner Initial  | Desig. ID | Document  |
| MC  | CA        | D. Marcuse, "Theory of dielectric optical waveguides," (Academic, New York, 1974).  |
|   | CB        | E. Luneville et al., "An original approach to mode converter optimum design," IEEE Trans. Microwave Theory Tech., 46, (1998).   |
|   | CC        | E. Mao et al., "Wavelength-selective semiconductor in-line fibre photodetectors," Electronics Letters, Vol. 36, No. 6, pp. 515-516, March 16, 2000.   |
|   | CD        | E. Marcatili et al., "Hollow metallic and dielectric waveguides for long distance optical transmission and lasers," Bell Syst. Tech. J., 43, 1783-1809 (1964).  |
|   | CE        | E. Peral et al., "Supermodes of grating-coupled multimode waveguides and application to mode conversion between copropagating modes mediated by backward Bragg scattering," J. Lightwave Tech., 17, 942-947 (1999). |
|   | CF        | F. Brechet et al., "Analysis of bandpass filtering behavior of singlemode depressed-core-index photonic bandgap fibre," Elec. Lett., 36, 870-872 (2000).  |
|   | CG        | F. Brechet et al., "Singlemode propagation into depressed-core-index photonic-bandgap fibre designed for zero-dispersion propagation at short wavelengths," Elec. Lett., 36, 514-515 (2000).                        |
|   | CH        | G. H. Childs, "50mm diameter TE <sub>01</sub> mode helical waveguide optimization," Electronics Lett., 14, 140-141 (1978).  |
|   | CI        | H. F. Taylor, "Bending effects in optical fibers," J. Lightwave Tech., 2, 617-628 (1984).   |
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|   | CK        | H. Kumric et al., "Optimization of mode converters for generating the fundamental TE <sub>01</sub> mode from TE <sub>06</sub> gyrotron output at 140 GHz," Int. J. Electron., 64, 77-94 (1988).                     |
|   | CL        | H. Yajima, "Dielectric bypass waveguide mode order converter," IEEE J. Quantum Electronics, 15, 482-487 (1979).   |
|   | CM        | I. Gannot, et al., "Current Status of Flexible Waveguides for IR Laser Radiation Transmission", IEEE J. Sel. Topics in Quantum Electr., IEEE Service Center, Vol. 2, No. 4, pp.880-888 (Dec 1996); XP000694378      |
|   | CN        | I. K. Hwang et al., "Long-period fiber gratings based on periodic microbends," Opt. Lett., 24, 1263-1264 (1999).  |
|   | CO        | I. Ogawa et al., "Design of a quasi-optical mode conversion system with variable output beam size," Int. J. Electron., 87, 457-467 (2000).  |
|   | CP        | J. A. Harrington, "A review of IR transmitting, hollow waveguides", Fiber Integr. Opt. 19, 211-227 (2000).  |
|   | CQ        | J.C. Knight et al., "Photonic band gap guidance in optical fibers" Science 282, 1476-1478 (1998).   |
|   | CR        | J. J. Refi, "Optical fibers for optical networking," Bell Labs Technical Journal, 4, 246-261 (1999).  |
|   | CS        | J. N. Blake et al., "Fiber-optic modal coupler using periodic microbending," Opt. Lett., 11, 177-179 (1986).  |
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| MC  | CU        | J.L. Auguste et al., "-1800ps/(nm-km) chromatic dispersion at 1.55μm in dual concentric core fibre", Elec. Lett., 28 <sup>th</sup> September 2000, Vol. 36, No. 20.   |

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| Examiner Initial  | Desig. ID | Document   |
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|   | DB        | K. J. Bunch et al., "The helically wrapped circular waveguide," IEE Trans. Electron Devices, 34, 1873-1884 (1987).   |
|   | DC        | K. O. Hill et al., "Efficient mode conversion in telecommunication fiber using externally written gratings," Electron. Lett., 26, 1270-1272 (1990).  |
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|   | DE        | L. Gruner-Nielson et al., "Dispersion compensating fibers," Optical Fiber Tech., 6, 164-180 (2000).  |
|   | DF        | L. M. Field, "Some slow-wave structures for traveling-wave tubes," Proc. IRE, 37, 34-40 (1949).  |
|   | DG        | Lars Gruner-Nielson et al., "New dispersion compensating fibers for simultaneous compensation of dispersion and dispersion slope of non-zero dispersion shifted fibres in the C or L band", OFC '00. |
|   | DH        | M. Ibanescu et al., "An all-dielectric coaxial waveguide," Science, 289, 415-419 (2000).   |
|   | DI        | M. J. Buckley et al., "A single period TE <sub>02</sub> -TE <sub>01</sub> mode converter in a highly overmoded circular waveguide," IEEE Trans. Microwave Theory Tech., 39, 1301-1306 (1991).        |
|   | DJ        | M. J. Weber et al., "Measurements of the electronic and nuclear contributions to the nonlinear refractive index of beryllium fluoride glasses," Appl. Phys. Lett., 32, 403-405 (1978).               |
|   | DK        | M. Miyagi, et al., "Transmission characteristics of dielectric-coated metallic waveguides for infrared transmission: slab waveguide model", IEEE J. Quantum Elec. QE-19, 136-145 (1983).             |
|   | DL        | M. Miyagi, et al., "Wave propagation and attenuation in the general class of circular hollow waveguides with uniform curvature", IEEE Trans. Microwave Theory Tech. MTT-32, 513-521 (1984).          |
|   | DM        | M. Otsuka et al., "Development of mode converters for 28 GHz electron cyclotron heating system," Int. J. Electron, 70, 989-1004 (1991).  |
|   | DN        | M. Thumm, "High power millimeter-wave mode converters in overmoded circular waveguides using periodic wall perturbations," Int. J. Electron., 57, 1225-1246 (1984).                                  |
|   | DO        | Mitsunobu Miyagi et al., "Design theory of dielectric-coated circular metallic waveguides for infrared transmission," J. Lightwave Tech., Vol. LT-2, 116-126, April 1984.                            |
| MC  | DP        | N. J. Doran et al., "Cylindrical Bragg fibers: a design and feasibility study for optical communications," J. Lightwave Tech., 1, 588-590 (1983).  |
|   | DQ        | Pochi Yeh et al., "Theory of Bragg fiber," J. Opt. Soc. Am., Vol. 68, 1196-1201 September 9, 1978.   |
|   | DR        | R. F. Cregan et al., "Single-mode photonic band gap guidance of light in air," Science, 285, 1537-1539 (1999).   |
|   | DS        | R.A. Abram et al., "Mode conversion in an imperfect waveguide," J. Phys. A, 6, 1693-1708 (1973).   |
|   | DT        | S. Ahn et al., "Analysis of helical waveguide," IEEE Trans. Electron Devices, 33, 1348-1355 (1986).  |
|   | DU        | S. H. Yun et al., "All-fiber tunable filter and laser based on two-mode fiber," Opt. Lett., 21, 27-29 (1996).  |
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| Examiner Initial  | Desig. ID | Document   |
| <b>MC</b>   | EA        | T. Cardinal et al., "Nonlinear optical properties of chalcogenide glasses in the system As-S-Se," J. Non-Cryst. Solids, 256, 353-360 (1999).   |
|   | EB        | T. Iyama et al., "Propagation characteristics of a dielectric-coated coaxial helical waveguide in a lossy medium, IEEE Trans. Microwave Theory Tech., 45, 557-559 (1997).            |
|   | EC        | T. Kawanishi et al., "Coaxial periodic optical waveguide," Optics Express, 7, 10-22 (2000).  |
|   | ED        | T. Liang et al., "Mode conversion of ultrafast pulses by grating structures in layered dielectric waveguides," J. Lightwave Tech., 15, 1966-1973 (1997).                             |
|   | EE        | T. M. Monro et al., "Holey Optical Fibers: An efficient modal model," IEEE J. Lightwave Technol., 17, 1093-1102 (1999).  |
|   | EF        | T. ul Hag et al., "Optimized irregular structures for spatial- and temporal-field transformation," IEEE Trans. Microwave Theory Tech., 46, 1856-1867 (1998).                         |
|   | EG        | W. Lawson et al., "The design of serpentine-mode converters for high-power microwave applications," IEEE Trans. Microwave Theory Tech., 48, 809-814 (May 2000).                      |
|   | EH        | Y. Fink et al., "A dielectric omnidirectional reflector," Science, 282, 1679-1682 (1998).  |
|   | EI        | Y. Fink et al., "Guiding optical light in air using an all-dielectric structure," J. Lightwave Tech., 17, 2039-2041 (1999).  |
|   | EJ        | Y. W. Li et al., "Triple-clad single-mode fibers for dispersion shifting," IEEE J. Lightwave Technol., 11, 1812-1819 (1993).   |
|   | EK        | Y. Xu et al., "Asymptotic analysis of Bragg fibers and dielectric coaxial fibers," In Proc. SPIE, A. Dutta, A. A. S. Awwal, N. K. Dutta, and K. Okamoto, eds., 4532, 191-205 (2001). |
| <b>MC</b>   | EL        | Yong Xu et al., "Asymptotic analysis of Bragg fibers," Optics Lett., Vol. 25, No. 24, pp. 1756-1758 December 15, 2000.   |
|   | EM        |  |

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13445-002002Application No.  
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by Applicant**

(Use several sheets if necessary)

(37 CFR §1.98(b))

Applicant  
Steven G. Johnson et al.Filing Date  
July 16, 2003Group Art Unit  
2874**U.S. Patent Documents**

| Examiner Initial | Desig. ID | Document Number | Publication Date | Patentee       | Class | Subclass | Filing Date If Appropriate |
|------------------|-----------|-----------------|------------------|----------------|-------|----------|----------------------------|
| MC               | AA        | 4,139,262       | 02/13/1979       | Mahlein et al. | 350   | 96.33    |                            |
|                  | AB        |                 |                  |                |       |          |                            |
|                  | AC        |                 |                  |                |       |          |                            |
|                  | AD        |                 |                  |                |       |          |                            |
|                  | AE        |                 |                  |                |       |          |                            |
|                  | AF        |                 |                  |                |       |          |                            |
|                  | AG        |                 |                  |                |       |          |                            |
|                  | AH        |                 |                  |                |       |          |                            |
|                  | AI        |                 |                  |                |       |          |                            |
|                  | AJ        |                 |                  |                |       |          |                            |
|                  | AK        |                 |                  |                |       |          |                            |

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|------------------|-----------|-----------------|------------------|--------------------------|-------|----------|--------------------|----|
|                  |           |                 |                  |                          |       |          | Yes                | No |
| MC               | AL        | DE 24 42 859    | 03/18/1976       | Germany                  |       |          | See U.S. 4,139,262 |    |
|                  | AM        |                 |                  |                          |       |          |                    |    |
|                  | AN        |                 |                  |                          |       |          |                    |    |
|                  | AO        |                 |                  |                          |       |          |                    |    |
|                  | AP        |                 |                  |                          |       |          |                    |    |

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|                  | AR        |   |
|                  | AS        |   |
|                  | AT        |   |

Examiner Signature

*M.R. Connelly-Cushura*

Date Considered

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